

Deptrum® Aurora 900

Product Specification

V1.0 - 2026/09/30

1 Revision History

Revision	Description	Date	Revised by
V1.0	Official release	2026/09/30	Hu Tao



Product Rendering (front view, without mounting wings)

2 Product Overview

Product Introduction

The Deptrum® Aurora 900 series depth camera captures the 3D structure of objects and scenes based on speckle structured light technology, and fuses the RGB image from the RGB camera with depth data to provide users with convenient and efficient 3D perception. Aurora 900 is equipped with a high-performance depth processing chip and a high-performance ISP, delivering high-quality RGB, IR, and depth images. The module integrates a security chip that signs the images to prevent image data tampering.

System Requirements

Depth map computation is performed inside the camera module, with no special computing power requirements for the back-end platform; Windows / Linux / Android are supported. For platforms with strong back-end computing power, the Deptrum® Aurora 910 series depth camera is recommended: the Aurora 910 series has no front-end depth computing capability and reconstructs depth using back-end computing power, making full use of existing hardware performance with better cost efficiency.

Product Features

- Low power consumption, compact size, high cost performance
- RGB image: 1080 × 1920 @ 25 fps
- RGB / IR / Depth aligned stream: 480 × 768 @ 12 fps
- All three images support an illumination range of 3 ~ 100,000 lux, covering both indoor and outdoor facial recognition performance
- RGB image supports closed-loop Face AE, ensuring performance in low-light and backlit scenarios
- The RGB camera supports an AF motor for near and far focusing, and supports close-range code scanning
- Temperature drift compensation ensures high-precision depth quality at all temperatures
- Hardware synchronization and pixel alignment of RGB / IR / Depth images
- Built-in security chip signs images to prevent image data tampering

Applications

- AI + 3D camera
- Facial recognition payment
- Volume measurement
- Door locks and access control

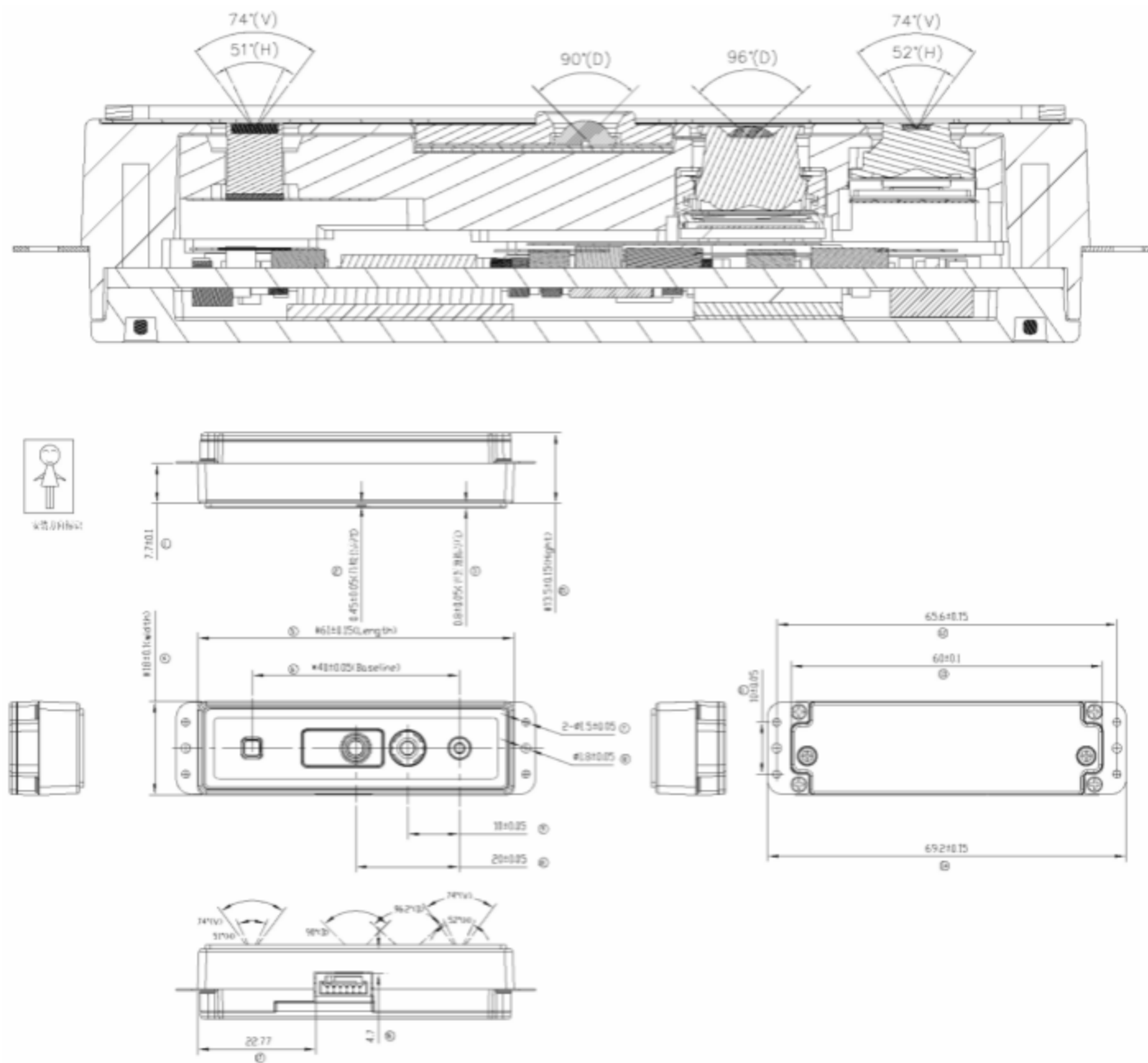
3 Core Specifications

Aurora 900 Specifications		
Module Parameters	Overall dimensions	61 × 18 × 13.5 mm (without mounting wings)
	Baseline	40 mm
	Interface	USB 2.0 Wafer connector
	Facial recognition working distance	0.3 ~ 1 m
	Code scanning working distance	5 ~ 30 cm
	Operating temperature	-10°C ~ +55°C
	Operating humidity	0% ~ 95% RH, non-condensing
	Operating illuminance	3 ~ 100,000 lux
	Power supply	5 V ± 10%, > 1.5 A
	Average power consumption	Standby < 550 mW; Facial recognition < 1.6 W; Code scanning < 1 W
Image Performance	ESD rating	Contact ±4 kV, air ±8 kV
	Safety	Class 1 laser safety
	Depth data format	Raw 16
Image Performance	Depth accuracy	3 mm @ 0.5 m; 4 mm @ 0.8 m; 7 mm @ 1 m
	Depth resolution / frame rate /	480 × 768 / 12 fps / 51° × 74°

	FOV	
	RGB data format (facial recognition)	JPEG
	RGB resolution / frame rate / FOV (facial recognition)	480 × 768 / 25 fps / 51° × 74°
	IR data format	Raw 8
	IR resolution / frame rate / FOV	480 × 768 / 12 fps / 51° × 74°
	RGB data format (code scanning)	JPEG
	RGB resolution / frame rate (code scanning)	480 × 768、720 × 1280、1080 × 1920, 25 fps
	RGB FOV (code scanning) ¹	51° × 74° @ 480 × 768 ; 56° × 88° @ 720P、1080P
	Image temporal alignment	Max. delay among the three images: 40 ms
	Image spatial alignment	±3 pixel
Firmware Capabilities	Firmware upgrade	Supports USB online upgrade
	Warm-start latency	< 300 ms
	Mode-switch latency	< 300 ms
System Compatibility	System compatibility	Supports Android 7 / 8 / 9 / 10; supports Windows 10

4 Module Dimensions & Structure

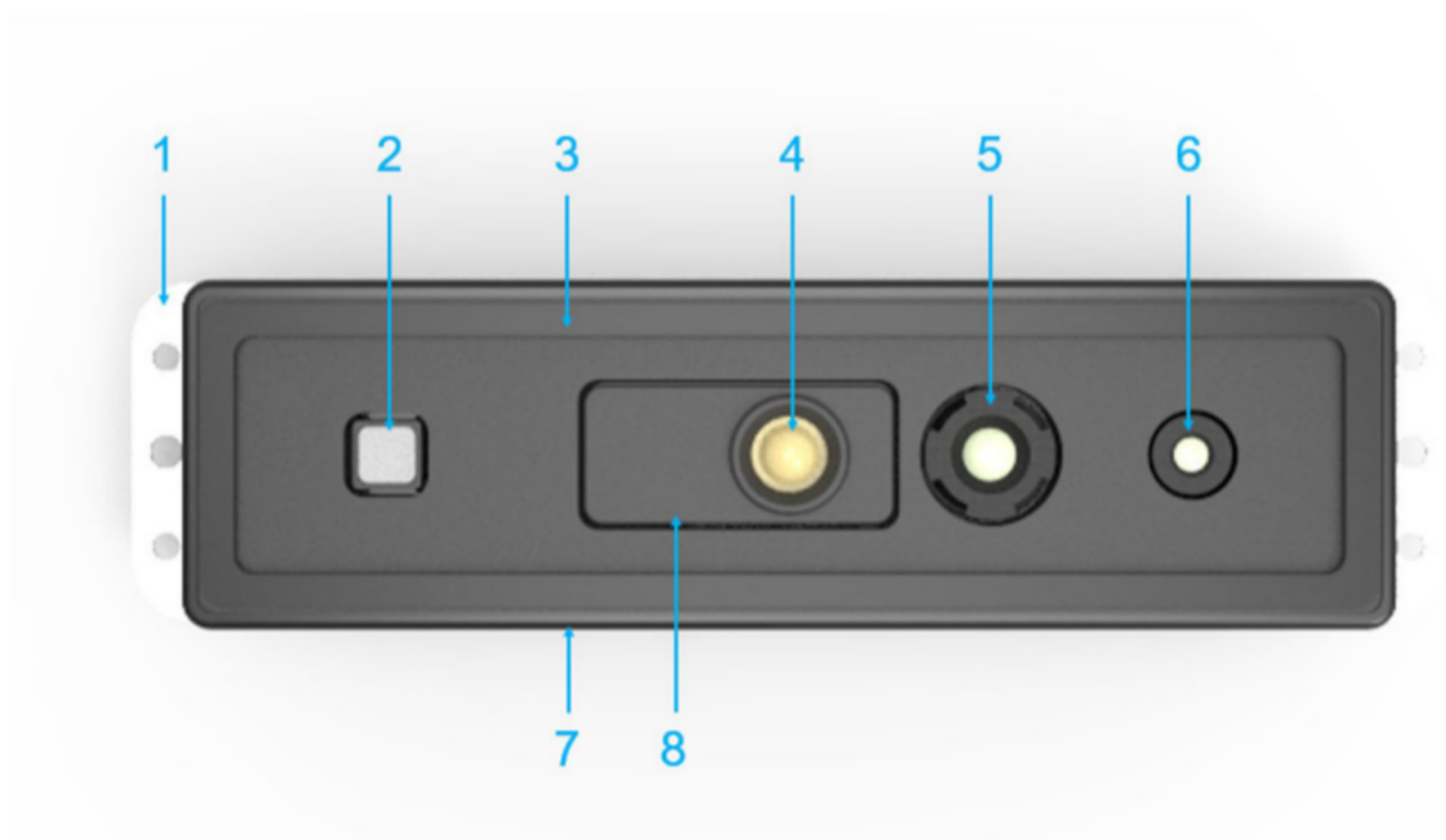
¹The RGB FOV differs across resolutions in order to make the most of the RGB lens's field of view in code-scanning mode.



Module dimension drawing (L61 × W18 × H13.5 mm, excl. mounting wings)

4.1 Module Description

The Aurora 900 module consists of a housing, mounting-wing steel plate, dot projector, IR fill-in illuminator, RGB camera, IR camera, USB Wafer connector, and a detachable silicone sleeve. The compact structure facilitates integration into host devices. Structural dimension data and images may vary slightly with specific product configurations; please refer to the actual product. The product's 3D drawing includes the safety FOV; please refer to the camera's 3D drawing for stacking design. The camera module dimensions are L61 × W18 × H13.5 mm (without mounting wings).



Module Layout Diagram (numbers correspond to the System Components table)

System Components	No.
Mounting wing - steel plate	1
Dot projector	2
Cushioning foam	3
Infrared Illuminator (IR fill-in illuminator)	4
RGB Camera (RGB Camera Module)	5
IR Camera (Infrared Camera Module)	6
USB Wafer connector	7
Silicone sleeve (detachable, replaceable as needed)	8

5 Module Electrical Requirements

5.1 PIN Definition

PIN NO.	Name	Type	Description
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1	VBUS	Power	5 V power input
2	VBUS	Power	5 V power input
3	D+	I/O	USB 2.0 D+
4	D-	I/O	USB 2.0 D-
5	GND	Power	Power ground
6	GND	Power	Power ground

5.2 Interface Definition



USB 2.0 Wafer interface definition (with PIN 1 position mark)

6 Environment & Reliability

Item	Parameter	Specification
Operating environment	Temperature	-10°C ~ +55°C
	Humidity	0% ~ 95% RH, non-condensing
	Illuminance	3 ~ 100,000 lux
Storage environment	Temperature	-30°C ~ +70°C
	Humidity	Relative humidity: 10% ~ 95%, non-condensing

7 Certification

Item	Specification
Laser eye safety	Class 1 , IEC 60825-1:2007 Ed 2, IEC 60825-1:2014 Ed 3
Environmental certification	RoHS

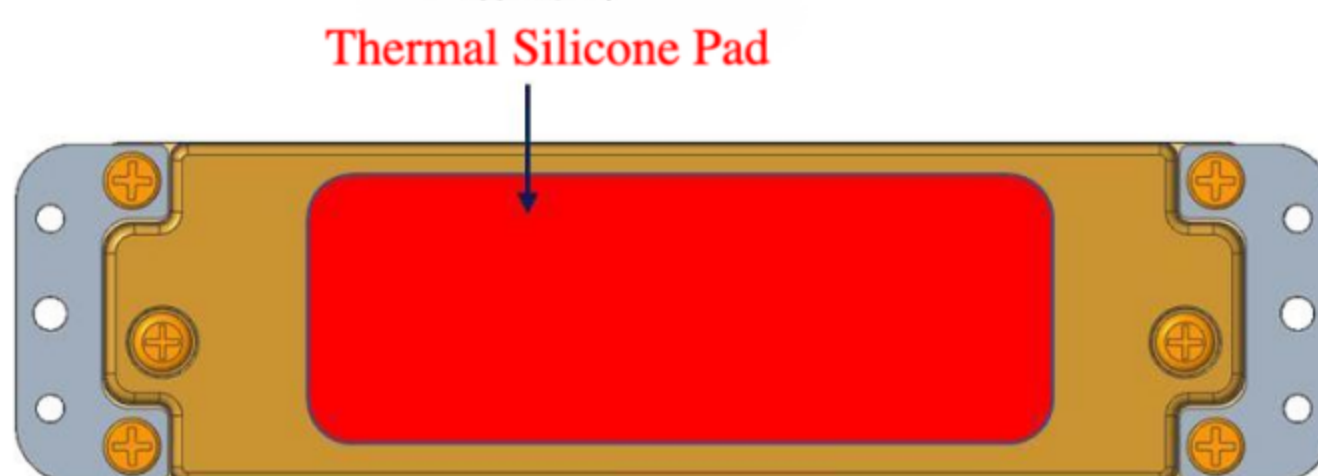
8 EMC

Item	Specification
ESD rating	Contact discharge ± 4 kV, air discharge ± 8 kV
RE rating	Complies with GB 9254 CLASS B

9 Thermal Design Recommendations

The Aurora 900 module generates heat during continuous operation. The host device structure must provide thermal management according to the following requirements to ensure depth accuracy and facial recognition performance over the full temperature range.

- Add heat conduction at the bottom of the module, e.g., with a thermal silicone pad. The pad should be compressible with low rebound force and a thermal conductivity of $\geq 3 \text{ W}/(\text{m} \cdot \text{K})$. Refer to the red area in the figure below for the attachment position.



Module thermal design diagram (the red area indicates the thermal silicone pad attachment position)

- Heat is conducted from the back of the thermal silicone pad to a metal heatsink, which can be made of CNC-machined or die-cast aluminum alloy with a thermal conductivity of $\geq 90 \text{ W}/(\text{m} \cdot \text{K})$. If part of the heatsink can be exposed outside the host device for air convection, heat dissipation will be more effective.
- During module operation, the maximum temperature rise of the housing must not exceed 20°C . The red areas in the figure mark the positions where the 3D ASIC and the SoC are in closest contact with the rear housing; these two positions have the maximum housing temperature rise.

10 Protective Cover Requirements

The front protective cover of the host device must meet the following requirements:

- Protective cover material: glass.
- The light-transmitting areas of the protective cover corresponding to the dot projector, IR camera, RGB camera, and IR LED must be opened by silk-screen printing. The opening size can refer to the FOV of each component in the drawings provided by Deptrum, or, according to the actual product structure, be expanded outward by $\geq 0.5 \text{ mm}$ on each side beyond the component FOV.
- Optical transmittance: for the dot projector area, the global minimum transmittance $T_{\min} \geq 90\%$ in the 800–1050 nm band; for the IR camera area, $T_{\min} \geq 90\%$ in the 800–1050 nm band; for the RGB camera area, $T_{\min} \geq 90\%$ in the 400–780 nm band; for the IR LED area, $\geq 90\%$ in the 800–1050 nm band.
- It is recommended to apply an AF coating on the outer surface of the protective cover to prevent fingerprints and oil stains from affecting facial recognition performance in actual use.
- Protective cover structural dimensions: when the material is glass, the thickness must be designed within 0.3–1.0 mm; the air gap between the protective cover and each optical component must be $< 0.5 \text{ mm}$, and the P-sensor rubber sleeve must contact the inner surface of the protective cover; the flatness of the protective cover must be $< 0.005 \text{ mm}$.

- Fingerprint and oil prevention: during module-to-host assembly, the surfaces of all optical components must be strictly protected from dust and contamination. During host device use, keep the outer surface of the protective cover clean to avoid affecting facial recognition performance.
- If a protective film is applied to the outer surface of the cover, cutouts must be made in the film at the window areas corresponding to the 5 components; otherwise, light transmittance and the facial recognition experience will be seriously affected.

11 Software Development

Customers can use the Deptrum Stream SDK for secondary development. The SDK supports Windows / Linux / Android platforms and x86_64 and ARMv7 / ARMv8 architectures, with specific performance optimizations for embedded architectures. For detailed usage, refer to the documentation included with the SDK.

12 Disclaimer

The device application information and other similar content described in this publication are provided for your convenience only and may be superseded by updated information. It is your own responsibility to ensure that your application complies with the technical specifications. Shenzhen Deptrum Technology Co., Ltd. makes no representations or warranties of any kind, express or implied, written or oral, statutory or otherwise, with respect to this information, including but not limited to representations or warranties of usage, quality, performance, merchantability, or fitness for a particular purpose. Deptrum assumes no liability for consequences arising from this information or its use. Deptrum products shall not be used as critical components in life support systems without the written approval of Shenzhen Deptrum Technology Co., Ltd. No license is conveyed, implicitly or otherwise, under any Deptrum intellectual property rights.

13 Technical Support

Support is available through the following channels:

- Email support: please send your questions to support@deptrum.com
- FAE support: please contact our sales team for FAE support

14 Precautions

- Do not heat this product with any other heat source.
- Do not drop or impact this product to prevent internal component damage and accuracy degradation; improper handling may damage internal components.
- Do not attempt to modify or disassemble this product in any way to avoid module damage and accuracy degradation.
- The module heats up after a period of use, which is normal. Heat dissipation can be applied to the back of the module.
- Do not store the module in high-temperature, high-humidity environments to prevent accuracy degradation or depth reconstruction failure.

15 Appendix

15.1 Class I laser safety certificate

Test item description	Deptrum Face Recognition 3D Camera	
Trade Mark	 DEPTRUM 光鉴科技	
Original Product/Equipment Manufacturer	Same as applicant	
Branding Manufacturer(s)	---	
Model/Type reference	U20L-DT, Aurora 900	
Ratings	5 V; 1 A; 1.6 W	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
☒ Testing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch	
Testing location/ address	198 Kezhu Road, Science City, Economic & Technology Development Area, Guangzhou, Guangdong, China	
Tested by (name, function, signature)	Zick Wu / Project Engineer	<i>Zick Wu</i>
Approved by (name, function, signature) ..	Alex Tan / Reviewer	<i>Alex Tan</i>

IEC 60825-1				
Clause	Requirement + Test		Result - Remark	Verdict
(4) Comparison with AEL				
According to client's announcement: Pulse width: 1,5 ms; F= 12 Hz; N = 120				
Condition	Evaluation method	Distance (mm)	AE (J)	AEL Class 1
Condition 3	Simplified (default) evaluation	100	$5,05 \times 10^{-7} \text{ J}$	a) $AEL_{\text{single}}: 7 \times 10^{-4} t^{0,75} C_4 \text{ J}$ $= 1,61 \times 10^{-6} \text{ J}$ b) $AEL_T: 3,9 \times 10^{-4} C_4 C_7 \text{ W};$ So $AEL_{\text{s.p.T}} = 9,82 \times 10^{-5} \text{ J}$ c) $AEL_{\text{s.p.train}}: AEL_{\text{single}} \times C_5$ $= 1,61 \times 10^{-6} \text{ J}$
Skin Thermal	Simplified (default) evaluation	0	$9,2 \times 10^{-6} \text{ J}$	a) $AEL_{\text{single}}: 7,7 \times 10^{-8} C_4 C_6 \text{ J}$ $= 1,61 \times 10^{-6} \text{ J}$ b) $AEL_T: 3,9 \times 10^{-4} C_4 C_7 \text{ W};$ So $AEL_{\text{s.p.T}} = 9,82 \times 10^{-5} \text{ J}$ c) $AEL_{\text{s.p.train}}: AEL_{\text{single}} \times C_5$ $= 1,61 \times 10^{-6} \text{ J}$
Conclusion:				
Measured emission power is not exceeding the AEL for Class 1, therefore the product is classified as Class 1 laser product.				